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1. (four times amended) A base station array antenna assembly having an operating frequency and a vertical radiation pattern with a main lobe axis defining a downtilt angle with respect to the earth's surface, the antenna assembly comprising:

a plurality of antenna means in first, second, and third antenna groups physically disposed along a backplane, the backplane having a longitudinal axis along which the antenna means are disposed;

differential phase adjustment means electrically connected on a path of transmission line means between the first and third antenna groups configured to simultaneously advance a phase angle of a signal to one of said first and third antenna groups and delay the phase angle of said signal to the other of said first and third antenna groups;

such that adjustment of the phase adjustment means results in variation of the vertical radiation pattern downtilt angle between a first fixed position and a second fixed position;

said differential phase adjustment means including coupling means arcuately moveable along an arcuate section of said transmission line means to cause said simultaneous advance of a phase angle of a signal to one of said first and third antenna groups and a delay of the phase angle of said signal to the other of said first and third antenna groups.

2. (original) The antenna assembly of claim 1, wherein the second and third antenna groups each comprise a plurality of antenna means.

3. (original) The antenna assembly of claim 2, wherein the first antenna group comprises one antenna means.

4. (original) The antenna assembly of claim 2, wherein the second and third antenna groups each comprises two antenna means.

5. (original) The antenna assembly of claim 2, wherein each of the antenna means comprises a log-periodic dipole array.

6. (original) The antenna assembly of claim 5, wherein each of the log-periodic dipole array antennas comprises generally complementary front and rear dipole sections wherein one arm of each dipole is provided by the front dipole section, and the opposing arm of each dipole is provided by the rear dipole section.

7. (original) The antenna assembly of claim 1, wherein the backplane is a plate of conductive material.

8. (original) The antenna assembly of claim 1, wherein the backplane is substantially perpendicular to the earth's surface.

9. (original) The antenna assembly of claim 1, wherein the phase adjustment means comprises:

input coupling means;

movable coupling means having a pivotally mounted first end electromagnetically coupled to

the input coupling means; and

transmission line means electromagnetically coupled to a second end of the movable coupling means.

10. (original) The antenna assembly of claim 9, further comprising drive means coupled to the movable coupling element.

11. (original) The antenna assembly of claim 10, wherein the drive means comprises an electric motor.

12. (original) The antenna assembly of claim 10, wherein the drive means is operable from a remote location.

13. (original) The antenna assembly of claim 12, wherein the drive means further includes means for transmitting position information relating to the phase adjustment means to the remote location.

14. (original) The antenna assembly of claim 9, wherein the input coupling means comprises an input coupling element formed in a T-shape from a plate of conductive material, and the input coupling element is coupled to an antenna assembly cable.

15. (original) The antenna assembly of claim 9, wherein the transmission line means comprises a semicircular, air-substrated transmission line section having opposing ends coupled to antenna feeder cables.

16. (original) The antenna assembly of claim 15, wherein the antenna feeder cables are coupled to

power dividers.

17. (original) The antenna assembly of claim 16, wherein each of the power dividers is a microstrip transformer fabricated on a substrate of relatively low-loss dielectric material.

18. (original) The antenna assembly of claim 16, further comprising a first power divider coupled to the input coupling element of the phase adjusting means and to a second power divider having a plurality of outputs, each output coupled to an antenna means of the second antenna group.

19. (original) The antenna assembly of claim 18, wherein:

the phase adjustment means has a range of adjustment including a minimum downtilt position, a mid-point, and a maximum downtilt position; and

electrical path lengths at the operating frequency, from the input coupling means to each of the antenna means, are selected to define a progressive phase shift between each of the antenna means such that, with the phase adjustment means set at its mid-point, the vertical radiation pattern downtilt angle is approximately 7 degrees.

20. (original) The antenna assembly of claim 19, wherein the vertical radiation pattern downtilt angle is approximately zero degrees with the phase adjustment means set at the minimum downtilt position.

21. (original) The antenna assembly of claim 19, wherein the vertical radiation pattern downtilt angle is approximately 14 degrees with the phase adjustment means set at the maximum downtilt position.

22. (once amended) The antenna assembly of claim 1, wherein said antenna assembly further comprises an input coupling means, said phase adjustment means providing a continuously variable electrical path length between said input coupling means and said first and third antenna groups.

23. (original) The antenna assembly of claim 22 wherein said phase adjustment means comprises transmission line means having first and second ends, and movable coupling means adjustably coupling the input coupling means to the transmission line means, whereby adjustment of said movable coupling means simultaneously decreases the electrical path length between said input coupling means and one of the first and second ends of said transmission line means and increases the electrical path length between the input coupling means and the other of said first and second ends of said transmission line means.

24. (four times amended) A base station array antenna assembly having an operating frequency and a vertical radiation pattern with a main lobe axis defining a downtilt angle with respect to the earth's surface, the antenna assembly comprising:

a plurality of antennas in first, second, and third antenna groups physically disposed along a backplane, the backplane having a longitudinal axis along which the antennas are disposed;

a phase adjustment mechanism electrically connected between the first and third antenna groups, the phase adjustment mechanism including:

an input coupling element;

a movable coupling section having a pivotally mounted first end electromagnetically coupled to the input coupling element; and

a semicircular, air-substrated transmission line section electromagnetically coupled to a second end of the movable coupling section;

such that pivotal position adjustment of the phase adjustment mechanism results in variation of the vertical radiation pattern downtilt angle between a first fixed position and a second fixed position.

25. (original) The antenna assembly of claim 24, further comprising a drive mechanism coupled to the movable coupling element.

26. (original) The antenna assembly of claim 25, wherein the drive mechanism is an electric motor.

27. (original) The antenna assembly of claim 25, wherein the drive mechanism is operable from a remote location.

28. (original) The antenna assembly of claim 27, wherein the drive mechanism transmits position information relating to the phase adjustment mechanism to the remote location.

29. (original) The antenna assembly of claim 24, wherein:

the phase adjustment mechanism has a range of adjustment including a minimum downtilt position, a mid-point, and a maximum downtilt position; and

electrical path lengths at the operating frequency, from the input coupling element to each of the antennas, are selected to define a progressive phase shift between each of the antennas such

that, with the phase adjustment mechanism set at its mid-point, the vertical radiation pattern downtilt angle is approximately 7 degrees.

30. (original) The antenna assembly of claim 29, wherein the vertical radiation pattern downtilt angle is approximately zero degrees with the phase adjustment mechanism set at the minimum downtilt position.

31. (original) The antenna assembly of claim 29, wherein the vertical radiation pattern downtilt angle is approximately 14 degrees with the phase adjustment mechanism set at the maximum downtilt position.

32. (four times amended) A base station array antenna assembly having an operating frequency and a vertical radiation pattern with a main lobe axis defining a downtilt angle with respect to the earth's surface, the antenna assembly comprising:

a plurality of antennas in first, second, and third antenna groups physically disposed along a backplane, the backplane having a longitudinal axis along which the antennas are disposed;

a phase adjustment mechanism electrically connected between the first and third antenna groups, the phase adjustment mechanism including:

an input coupling element;

a movable coupling section having a pivotally mounted first end electromagnetically coupled to the input coupling element; and

a semicircular, air-substrated transmission line section electromagnetically coupled to a second end of the movable coupling section;

the phase adjustment mechanism having a range of adjustment including a minimum downtilt position, a mid-point, and a maximum downtilt position;

a drive mechanism coupled to the movable coupling section;

electrical path lengths at the operating frequency, from the input coupling element to each of the antennas, are selected to define a progressive phase shift between each of the antennas such that, with the phase adjustment mechanism set at its mid-point, the vertical radiation pattern downtilt angle is approximately 7 degrees;

such that adjustment of the phase adjustment mechanism results in variation of the vertical radiation pattern downtilt angle.

33. (original) The antenna assembly of claim 32, wherein the drive mechanism comprises an electric motor drive capable of activation from a remote location, and transmitting position information relating to the phase adjustment mechanism to the remote location.

34. (previously added) The antenna assembly of claim 1 wherein the coupling means is capacitively coupled to the transmission line means.

35. (previously added) The antenna assembly of claim 1 wherein the coupling means includes a pivotally mounted, electrically conductive section.

36. (previously added) The antenna assembly of claim 1 further comprising drive means coupled to the coupling means.

37. (previously added) The antenna assembly of claim 36 wherein the drive means comprises an electric motor.

38. (previously added) The antenna assembly of claim 36 wherein the drive means receives control inputs from a remote location.

39. (previously added) The antenna assembly of claim 38 wherein the drive means further includes means configured to transmit position information relating to the phase adjustment means to the remote location.

40. (previously added) The antenna assembly of claim 39 wherein said means configured to transmit position information includes a position detector.

41. (previously added) The antenna assembly of claim 40 wherein said position detector comprises a Hall effect sensor, an optical encoder, a synchro servo system or other position detection device.

42. (previously added) The antenna assembly of claim 36 wherein said drive mechanism is a resolver, or servomotor, or stepping motor or other electric motor, or other positioning device.

43. (previously added) The antenna assembly of claim 1 wherein at least one of said antenna groups includes in a feed comprising a dielectric-substrated microstrip transformer.

44. (previously added) The antenna assembly of claim 1 wherein said arcuate section of said transmission line means comprises an air-substrated metal conductor.

45. (previously added) The antenna assembly of claim 24 wherein the second end of the movable coupling section is capacitively coupled to the transmission line section.

46. (previously added) The antenna assembly of claim 24 wherein at least one of said antenna groups includes in a feed comprising a dielectric-substrated microstrip transformer.

47. (previously added) The antenna assembly of claim 25 wherein said drive mechanism comprises a resolver, or servomotor or stepping motor or other electric motor, or other positioning device.

48. (previously added) The antenna assembly of claim 28 wherein the drive mechanism includes a position detector.

49. (previously added) The antenna assembly of claim 48 wherein said position detector comprises a Hall effect sensor, an optical encoder, a synchro servo system or other position detection device.

50. (previously added) A plurality of antenna assemblies each as defined in claim 1, supported by a tower or other common support structure.

51. (previously added) The assemblies of claim 50 designed such that each assembly covers a sector of a cell.

52. (previously added) The assemblies of claim 51 comprising three in number, wherein each of the assemblies covers a 120 degree sector of a cell.

53. (previously added) The assemblies of claim 50, wherein each assembly is coupled to a drive mechanism receiving control inputs provided from a remote location.

54. (previously added) The assemblies of claim 53, wherein each assembly provides beam position information to the remote location.

55. (previously added) The assemblies of claim 54, wherein the position information is provided in each assembly by a position detector.

56. (previously added) The assemblies of claim 55 wherein the position detector comprises a Hall effect sensor, a synchro/servo system, or optical encoder.